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RECORD OF ORAL HEARING

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte NELSON GONZALEZ and HUMBERTO ORGANVIDEZ

Appeal 2008-5888  
Application 10/689,716  
Technology Center 2600

Oral Hearing Held: December 9, 2008

Before JOSEPH F. RUGGIERO, ROBERT E. NAPPI, and JOHN A. JEFFERY, Administrative Patent Judges

ON BEHALF OF THE APPELLANTS:

KEVIN G. SHAW, ESQ.  
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The above-entitled matter came on for hearing on Tuesday, December 9, 2008, commencing at 10:05 a.m., at The U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia, before Janice A. Salas.

1 THE CLERK: Calendar number 9, appeal number 2008-5888, Mr.  
2 Shaw.

3 MR. SHAW: My name is Kevin Shaw and I represent the appellant in  
4 this case. The technology that we're looking at right now relates to a novel  
5 and nonobvious motherboard concept for supporting high-performance  
6 graphics.

7 The invention particularly relates a computer utilizing a motherboard  
8 that's capable of leveraging multiple high-performance video cards via two  
9 high-speed video card slots and a scalable interconnect.

10 In order to understand the language of the appellant's claims and the  
11 relevance it has with respect to the prior art, I think it's important to kind of  
12 understand the evolution of the video card concept very quickly. Back in the  
13 early '90s, Intel introduced the PCI interconnect concept. It stands for  
14 peripheral component interconnect.

15 That's a local bus system operated at about 133 megabits per second,  
16 and it was an advance at the time of the 486 processor. It essentially had  
17 enough bandwidth for all the computing needs that you could possibly have  
18 at that time.

19 Around that time it also became popular to utilize central processing  
20 units on the motherboards which would do basic -- all of your basic  
21 computation calculations as well as a video card which would have an off-  
22 loaded GPU or graphical processing unit.

23 A GPU differs from a central processing unit importantly because it's  
24 optimized to perform floating-point calculations, which are very important  
25 in graphical rendering and particularly, later on nowadays, in 3-D graphical  
26 rendering.

1           While a -- you know, a CPU is of course not necessarily optimized for  
2 one particular type of computation because the central processing unit does  
3 everything on the computer.

4           Eventually the PCI interconnects essentially became outdated. The  
5 computers became faster and faster. The processor, central processor,  
6 became faster. The GPUs became faster, but you were still essentially  
7 limited to 133 megabits per second, the transfer rate of the PCI interconnect.

8           So then they came up with the AGP slot, accelerated graphical port.  
9 Essentially the AGP was just a specialized PCI slot. It operated at about  
10 twice the data rates of the PCI interconnect. It had dedicated lanes to and  
11 from the central processor. It also allowed the video card to off-load certain  
12 texture memory storage on the central memory of the motherboard.

13           Again, this was done approximately 1997 and it became outpaced as  
14 processors became faster and faster. So you can see that there's becoming a  
15 pattern here. Everyone continued to get faster and faster processors, and  
16 they're like, Well, let's scale up the interconnect, and that was essentially the  
17 way that they addressed issues with respect to the graphical rendering.

18           In the late '90s there became a jump in the graphical processing unit  
19 technology. You started getting what they termed the 3-D graphical chips,  
20 and these completely blew away the AGP -- capabilities of the AGP port.  
21 Essentially, you couldn't get everything that you could possibly want off of  
22 these cards just because the interconnect dynamonoplic.

23           So then we turn to approximately the early 2000 -- about 2002. The  
24 PCI Express standard was introduced. PCI Express totally changed the way  
25 the local bus was done. PCI is a -- it's a parallel data transfer structure. It's -  
26 - which essentially means that communications from me to you and from

1 you back to me travel on the same wire.

2 So unfortunately, you can see that you can kind of end up getting a  
3 queue at times. PCI Express, however, went serial. I would have one wire  
4 that would go to you. You would have a separate wire that would come  
5 back to me, and everything is assigned in lanes. And another interesting  
6 feature of PCI Express is that it's scalable.

7 What that means is that the two processors or, you know, whatever the  
8 two devices are that are going to talk over, the bus, essentially negotiate  
9 early on how many lanes you're going to have.

10 The computer, you know, has the capability, therefore, to decide at  
11 certain times to assign more lanes, more through -- put particular devices or  
12 scale them back at other times when it's needed elsewhere.

13 This essentially blew the -- the AGP port out of the water. An eight-  
14 bit -- I mean, an eight-lane slot has, I believe, a little more than the fastest  
15 version of AGP, and the 16-lane slot, which is kind of standard now for PCI  
16 Express for high-performance video cards, is more than double.

17 So what we're looking at right now is that around 2002 the standard  
18 became to use a PCI Express slot for high-performance video cards, and that  
19 slot became termed essentially a high-speed video card slot in the industry.

20 This brief history is important for several reasons. First, it shows that  
21 there's essentially a long-felt need in the computer industry for solving this  
22 problem. Everyone continued to faster processors, faster interconnect, faster  
23 processors, faster interconnect, and they were kind of stuck in that mold.

24 Second, it's important in providing a proper construction to the claims  
25 on appeal, which I'll get to, and third, it's helpful understanding exactly what  
26 is described in the prior art references. Referring back to claim 1 as being

1 illustrative -- there's other independent claims, of course, but this one has  
2 essentially the limitations I'm going to be talking about here.

3 You have a motherboard, a chip set for managing data transfers, a  
4 scalable interconnect. A chip set and scalable interconnect, of course, are  
5 essentially the chip set and the PCI Express standard or whatever the  
6 scalable interconnect standard is.

7 There are other scalable interconnect standards which are described in  
8 our specification. I'll just generally refer to PCI Express because that's the  
9 preferred in the industry right now.

10 And there are a plurality of high-speed video card slots which I  
11 mentioned before would be essentially a high-lane scalable interconnect slot  
12 adapted essentially for video cards, and then wherein the motherboard  
13 enables the first and second video cards to attach respectively to one video  
14 card in the first video card and the second video card, and they operate in  
15 parallel.

16 Looking at the prior art rejections right now, we have three references.  
17 The first and primary reference is Levy, which essentially describes nothing  
18 other than a particular implementation of PCI Express standard.

19 The examiner points -- in particular, paragraph 16 is showing that this  
20 teaches the -- using PCI Express or a scalable interconnect to connect to  
21 high-performance video cards.

22 This is just not the case. If you read paragraph 16 carefully, alone and  
23 in conjunction with the rest of the specification, it becomes clear that it's just  
24 essentially telling you can use PCI Express to connect basically any  
25 peripheral or any device on a motherboard or to a central processing unit.

26 Paragraph 16 reads, A computing device may -- I'm going to skip a

1 few of the reference numerals just to make it easier to understand -- may  
2 comprise one or more devices such as, for example, Ethernet cards, video  
3 cards, RAID controllers, SCSI controllers, ETA disk controllers, PCI  
4 bridges, et cetera, coupled to a route device of the chip set. That's it.

5 There is no other reference anywhere in this patent to video cards,  
6 video technologies, mechanisms for displaying video, processing --

7 JUDGE HAIRSTON: Well, paragraph 16 mentions video cards.

8 MR. SHAW: Right. I'm saying throughout the rest of the  
9 specification, this is it. This is the only reference whatsoever.

10 So when you look at this, I believe it's an improper interpretation of  
11 this reference to say that it's saying you should connect two video cards to a  
12 single motherboard or connect two Ethernet cards to a single motherboard or  
13 connect two RAID controllers to a single motherboard. At the time of this  
14 reference and at the time of the applicant's invention --

15 JUDGE HAIRSTON: Well, the examiner didn't rely on this reference  
16 for a motherboard.

17 MR. SHAW: No. It relied on this reference for saying that you could  
18 use a scalable interconnect to connect two video cards together.

19 JUDGE HAIRSTON: Right.

20 MR. SHAW: Which, you know, using the scalable interconnect to a  
21 motherboard, frankly, you know, that's something we admit that you're  
22 going to have a motherboard in any event anyway. I really don't see what  
23 the point of Stufflebeam is, Stufflebeam in which they rely upon for a  
24 motherboard.

25 It's a terrible reference. It actually deals with the hot swapping of  
26 video cards in the PCI -- PCI Express with the older PCI standard. The

1 older PCI standard would essentially -- it was a quick connect system where  
2 you would plug the cards in and the computer would recognize them and  
3 everything but --

4 JUDGE HAIRSTON: Which reference are you talking about?

5 MR. SHAW: Stufflebeam.

6 JUDGE HAIRSTON: Stufflebeam.

7 MR. SHAW: That was the second one.

8 JUDGE HAIRSTON: Okay.

9 MR. SHAW: So that one's getting around the problem of you  
10 essentially couldn't swap cards out while you have your computer on. You  
11 had to power everything down and then open the case, so for certain  
12 circumstances that was inconvenient for people because of course  
13 conventional motherboards only have so many slots.

14 When you talk about the invention of Levy, it's implicit that there's  
15 going to be a motherboard around somewhere if you're having a PCI Express  
16 standard going on.

17 JUDGE HAIRSTON: Right.

18 MR. SHAW: I mean, so I'm going to essentially concede that point,  
19 and Stufflebeam I don't think adds anything to the discussion.

20 So when you look at Levy, what they're essentially doing is take a  
21 listing of potential elements. Like, for example, if I tell you that my -- I  
22 have a one-car garage and my one-car garage can hold cars and trucks, it  
23 doesn't mean you can put two trucks in it or two cars frankly.

24 I mean, that's the interpretation that this is providing in Levy, and this  
25 goes completely contrary to the understanding and technology at the time  
26 that you would connect two video cards together on the same motherboard



1 with a scalable interconnect or frankly, any -- any interconnect at that time  
2 or bus.

3 Turning now to the other reference that I'll talk about a bit is Grimaud.  
4 That reference was filed in October 1994.

5 Going back to the history I provided before, that time frame was --  
6 prior to the -- even the introduction of the AGP card at that time, so we're  
7 talking about the early PCI standard in these particular -- it's interesting to  
8 note that Levy has absolutely nothing -- stepping back -- has absolutely  
9 nothing to do with video processing technology and neither does  
10 Stuffbeam.

11 Grimaud does, so I'm going to talk about that one the most. However,  
12 Grimaud is -- while it's addressing the issue of essentially not having enough  
13 processing power to perform graphical calculations, its problem is particular  
14 to a particular system that it's talking about.

15 You will note that it incorporates by reference a prior application  
16 linked to a virtual reality system.

17 That virtual reality system utilizes a particular feeding node structure  
18 for performing the graphical calculations, and this graphical processing  
19 system of Grimaud does utilize multiple processors in order to perform the  
20 graphical calculations faster.

21 However, it doesn't necessarily do so using high-speed video cards,  
22 and I think the best interpretation in this reference is that it doesn't.

23 First off, those particular -- the particular calculations that are being  
24 performed are not the type that will be optimized by a GPU versus a CPU.

25 I briefly alluded to the differences between them before that a GPU,  
26 which you will find in a high-speed or high-performance video card which

1 you typically connect to a motherboard via a high-speed video card slot, is  
2 optimized for particular data calculations. You would want a more generic  
3 processor than a GPU for this type of tree structure.

4 Secondly, when you look at the reference to Grimaud that the  
5 examiner points to for saying that it could be multiple processors into a --  
6 into two high-speed video card slots on a motherboard, it points to a  
7 paragraph -- one particular sentence in the entire specification that states, "A  
8 device built according to the present invention may comprise a monolithic  
9 board with processors already in place or alternatively, a bus with card slots  
10 so that users may add processors as desired."

11 It talks about slots here, but frankly, it doesn't talk about one high-  
12 performance video card slots or using a scalable interconnect.

13 JUDGE JEFFERY: I wanted to ask you about the Grimaud reference.  
14 Just at a fundamental level, the figure on the front page of the patent where  
15 you've got two graphics processors that are operating in parallel, 100-A and  
16 100-B, am I understanding your position that those -- that doesn't suggest a  
17 high-speed video card per se in terms of the way it's claimed?

18 You know, these graphics processors are in fact operating in parallel,  
19 it sounds like, to render --

20 MR. SHAW: The concept of utilizing multiple processors is known,  
21 and we admit that in, actually, the background of our specification.

22 The issue becomes how do you utilize them together and secondly,  
23 how do you get over the problem of communication between multiple  
24 processors and the essential processor and using the scalable interconnect  
25 like this it, you know, has various advantages, the first being of course that  
26 you can assign as many number of lanes as you want.

1           Secondly, that you can utilize off-the-shelf components and they don't  
2 necessarily have to be matching, which is very important, as you guys  
3 probably know, the computer industry right now, it's all about configuration.

4           You go into a store now and you'll see ten computers that look exactly  
5 the same and you have to sit there and stare at the labels for 15 minutes to  
6 figure out the differences between the two of them because there's, you  
7 know, a 10 buck difference in price between one and 30 bucks for the other,  
8 and for the life of you, you can't figure out what's what.

9           This is essentially the business model that they've adopted and the  
10 reason being that, you know, certain things are optimized for certain  
11 purposes.

12           Certain cards work better for certain chips and not -- and this  
13 flexibility is important in the marketplace, and I think, frankly, the evidence  
14 that's of record right now with respect to secondary considerations  
15 completely supports that.

16           Going back again to the history of what's been going on in the video  
17 processing field, when applicants introduced this -- and we have a  
18 declaration on file by -- can't remember the gentleman's name off the top of  
19 my head -- Frank Azor. He has a declaration dated April 2006.

20           Within two years of introducing this board by our client, the appellant  
21 in this case, there were over 40 copycat boards which utilize this technology.  
22 There was none before it.

23           Additionally, within three months of this -- this is actually detailed in  
24 our petition to make special. I believe that's filed within -- a year within the  
25 case. I don't have the exact date in front of me.

26           But within three months of this being introduced, the first copycat

1 board reached the market, and also, when you look at the declaration of  
2 Frank Azor, I think it's important to also consider the lauding that came out  
3 in the industry.

4 You know, there are the various statements in there saying that it's a  
5 paradigm change. Some of the other statements in there talk about being  
6 completely blown away by this, and these are people that are essentially  
7 writers in the field that focus on this.

8 IGN.net I believe was one the writers worked for. Let's see.  
9 IGN.com. We got a chance to see the new technology earlier this morning  
10 in this board.

11 The technology is complicated, but it's fairly straightforward, and  
12 that's, I think, the problem that the examiner has in this and that's that it  
13 ended up not being addressed in this field because it seems very, very simple  
14 to combine two high-speed video cards on a single motherboard using high-  
15 speed video card slots.

16 Frankly, there were no motherboards out there that even supported  
17 this technology until the appellant decided if I put one motherboard on there,  
18 why not put two?

19 And conventionally, the PCI Express standard only handles 24 lanes  
20 of data. In the future -- you know, right now, they're talking about scaling  
21 that up a little bit so that way you could have 32, which would be 16 times 2.

22 If you look at 24, that allows you one 16 slot and one 8 slot, but  
23 having a scalable interconnect like PCI Express, that's not a big deal when  
24 you put two high-performance video cards into the, you know, for example,  
25 an 8 slot and a 16 slot because they can essentially -- the interconnect allows  
26 the central processing unit to assign things flexibly to one processor or the

1 other.

2 So that's the beauty of this situation and it provides amazing cost  
3 savings and it gets you out of the rat race of trying to get faster and faster  
4 processors or faster and faster interconnects.

5 So I think that's the issue that you really need to resolve on this appeal  
6 is that when you look at maybe yes, it talks -- you know, it talks about PCI  
7 Express and you can interconnect any kind of device you want, including  
8 hard drive controllers, Ethernet cards, et cetera.

9 But frankly, it's not talking about having multiple Ethernet cards. It's  
10 not talking about having multiple video cards on the same board, and, you  
11 know, this PCI Express technology was around for a while before the  
12 appellant introduced this X2 motherboard product, which is the product that  
13 embodied this and actually started the ball rolling in this technology.

14 And, you know, they introduced theirs a year later. A year is a long  
15 time in this industry and no one else jumped the gun and came in, and  
16 frankly, you know, the standard is talked about publicly and everyone knows  
17 it's coming well before it's released anyway, so it's not necessarily even a  
18 year after the standard was released. It's a lot more time than that so --

19 JUDGE JEFFERY: Counsel, I do have a question for you just at a  
20 fundamental level. Isn't this just taking, though, parallel processing ideas  
21 and applying it to a video card concept in that where the invention is  
22 basically two video cards that are on a single motherboard to parallel process  
23 the video, if you will, simultaneously or in parallel.

24 Why isn't this a KSR situation where -- you know, we know parallel  
25 processing is known in the art kind of thing in terms of its advantages over a  
26 single processor.

1           Why wouldn't this be a near -- you know, skilled artisans would  
2 recognize that I can improve a video context in a similar fashion by parallel  
3 processing, if you will, multiple video cards as opposed to a single video  
4 card.

5           I'm thinking, like I say, KSR here in terms of improvements,  
6 improving similar devices in the same way kind of thing, that is to say via  
7 parallel processing. Why is this then not that kind of situation?

8           MR. SHAW: We acknowledge the concept of parallel processing. I  
9 mean, frankly, that's what Grimaud teaches and, you know, there's dual core  
10 processors or even double processors on motherboards which were known  
11 before this.

12          The issue again becomes why would one try to use two motherboards  
13 as opposed to putting two processors on the same board. I mean, if you're  
14 talking really about dual processing --

15          JUDGE JEFFERY: Do motherboards -- let me ask you this, though,  
16 Counsel. At the time of the invention, was it known to have multiple  
17 processors for parallel processing purposes on a same motherboard?

18          MR. SHAW: Yes.

19          JUDGE JEFFERY: Okay. So now we're talking --

20          MR. SHAW: Yes, it was. You can have multiple chips on a single  
21 video card nowadays. I don't nec -- I'm not going -- I'm not meaning for the  
22 record that that was the case back at this time. I actually don't know.

23          But frankly, you know, assuming for argument purposes, there was  
24 such a card, you would still have the problem of the 16 lanes if you put --  
25 you know, there's nothing more than a 16-lane card, if you talk about even  
26 with PCI Express.

1           So if you put two processors on the same video card and stick that into  
2   a slot, you still hit that upper level of, whatever it is, 520, whatever,  
3   megabits per second of communication between the card.

4           JUDGE JEFFERY: And that's where the scalable interconnect comes  
5   into play.

6           MR. SHAW: When you use the combination of multiple -- multiple  
7   expansion cards, which are used in a high-performance video card slot  
8   which has the scalable interconnect that allows -- that essentially allows you  
9   to get past 16 as being your upper level, as well as get past the problems of  
10   flexibly assigning calculations back and forth.

11          Not only that, of course, there's the issue I mentioned before of being  
12   able to configure things however you see fit in your factory or even, you  
13   know, having things ordered on-line, which was essentially the business  
14   model of our client in this case.

15          JUDGE HAIRSTON: Counsel, can I get you to take a minute to sum  
16   up. We've run over timewise.

17          MR. SHAW: Sure. Very quickly, like I mentioned before, the claims  
18   sound very simple when you look at it, and the simplicity of this solution is  
19   its -- is its value. Its value is shown by the copycats jumping into the  
20   industry immediately after our client introduced this product. The product  
21   has been lauded.

22          There was a paradigm shift in the industry, and frankly, it's become  
23   almost standard now where -- when you're talking about high-performance  
24   end, almost everyone now offers multiple video card configurations on their  
25   computers.

26          When you have the petition of Frank Azor, you can see essentially

1 every motherboard company is offering one right now or actually, was  
2 offering one as of 2006. Now in 2008, two years after that was -- it's much  
3 larger. Trust me. So in that regard, I think it's important to look at these  
4 combinations in reference.

5 And each references has its weaknesses that I've mentioned before,  
6 and look at them in light of the secondary evidence that I didn't think the  
7 examiner gave proper weight to, and I think you'll have to come to the  
8 conclusion that KSR, frankly, all elements are not taught in all the references  
9 and there is no road map provided by any of the references to one skilled in  
10 the art to make the paradigm shift that the appellants have.

11 JUDGE HAIRSTON: Any questions?

12 JUDGE NAPPI: None from me. Thank you.

13 JUDGE HAIRSTON: Do you have a question?

14 JUDGE JEFFERY: No.

15 JUDGE HAIRSTON: Thank you, counselor.

16 MR. SHAW: Thank you.

17 (Whereupon, the proceedings at 10:31 a.m. were concluded.)